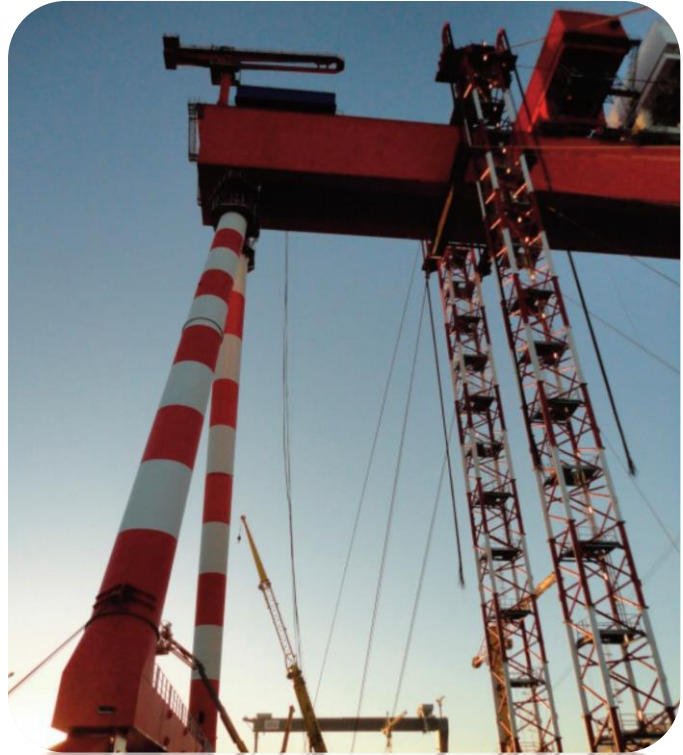
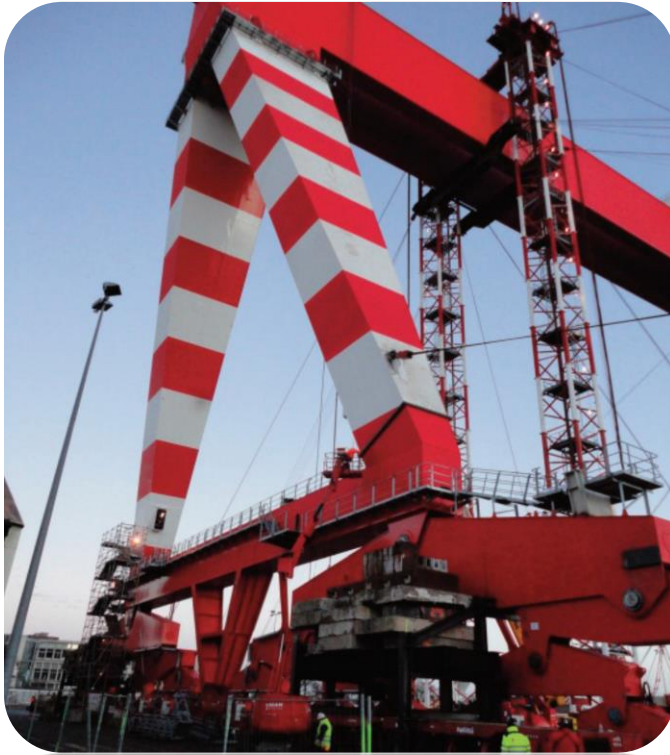


FRANCE: ERECTION OF A 1 400 TON CAPACITY GOLIATH GANTRY CRANE

PROJECT	EQUIPMENT	WEIGHT
H. INDU./SHIPBUI.	STRAND JACK AND TOWER LIFT SYSTEM SPMTs	AGGREGATE 3619 TON



Fagioli was contracted for the lifting and assembling operations of a Goliath crane with capacity up to 1400 t in Saint Nazaire, France. This challenging job involved either the heavy transport and lifting departments and Fagioli engineers to perform the assembling of the crane. The job was performed during the second half of 2013 after detailed engineering studies were issued between the end of 2012 and the beginning of 2013. The items to be lifted were the following listed in the chart on the right:

Services provided for this projects

-heavy transport executed by SPMTs -heavy lifting executed by means of lifting tower and strand jacking system -engineering

Crane Components	Weight
Main girder	1860 t
Upper trolley (A)	426 t
Upper trolley (B)	426 t
Lower trolley	178 t
Service crane (1)	44 t
Service crane (2)	44 t
Hinged leg	180 t
Fixed leg	461 t
Total weight	3619 t

The main operations could be divided in 6 steps:

STAGE 1 - POSITIONING OF LIFTING BEAMS UNDER THE MAIN GIRDER

The main girder was previously assembled on ground level, including the upper and lower trolleys, by the client. In order to lift the main girder with the tower lifting system it was necessary to place no.4 lifting beams underneath the girder, each one transported by Fagioli's SPMTs. The lifting beams were placed onto the ground close to the base frame and then lifted by means of two mobile cranes approx. 1m until they reached the bottom flange of the main girder.

STAGE 2 - INSTALLATION OF SERVICE CRANES

No.2 service cranes were installed on top of the ends of the main girder by using cranes. The no. 2 Service Cranes were transported with SPMTs from "Pre-assembly Area" and lifted by mobile cranes and placed onto main girder parts.

STAGE 3 - INSTALLATION OF LEG HEADS

The third step involved assembling the main girder with the 2 heads (95 and 36 ton) of the fixed and hinged legs. The main girder was lifted by strand jacking system approx. at 6,5 m until the bottom flange of the girder was at 10,0 m above the ground, then the two heads were connected to it. Once the operation was completed, the main girder was lowered and stored on the ground on temporary supports.



Above: Detail of lifting beams under the girder (Stage 1)



Above: Detail of legs' heads (Stage 3)



Above: Detail of the legs (Stage 5)

STAGE 4 - CONNECTION OF THE CRANE LEGS TO THE MAIN GIRDER

SPMTs were used to move the crane's legs close to the legs' heads connecting points. The main girder was lifted approx. 3,5 m until the bottom flange reached 13,5 m, this allowed the legs to go underneath it. The legs were carried by SPMTs and were moved closer to the main girder. Once in position the trailers raised up until the legs top pad-eyes were aligned with the pad-eyes underneath the main girder. After that the client connected the legs to the main girder.



STAGE 5 - LIFTING OF THE MAIN GIRDER

The main girder was lifted approx. 41,5 m until the bottom flange of the girder is at 55 m from ground. During the lifting the main girder stability guys were de-tensioned up to approx. 10 t and continuously monitored.

Above: Bogey with SPMTs support (Stage 6)

STAGE 6 - CONNECTION OF BOGEYS

Fixed and hinged bogeys were completely assembled and ready to be installed. Fagioli SPMTs were inserted underneath the stability frames of fixed and hinged legs bogeys. The main girder was lifted until the bottom flange of the girder is at 66 m above the ground. Once fixed and hinged bogeys were set, Fagioli tower lifting system started lowering the crane legs onto the bogeys. Then the client proceeded to connect the legs with the bogey.



Above: Detail of Bogey

-Fagioli used state of the art tower lift and strand jacking system which enabled to install the different sections of the Goliath cranes -Dedicated engineering studies to design a unique equipment able to perform heavy lifting and transport activity at the same time. -Significant time schedule reduction for lifting and installation operations -Complex operation which involved great safety precautions for the stability of the towers.